A COMPARATIVE STUDY ON EFFECTIVENESS OF FORCED EXPIRATORY TECHNIQUE IN CHRONIC BRONCHITIS

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DISSERTATION WORK ENTITLED

A COMPARATIVE STUDY ON EFFECTIVENESS OF FORCED EXPIRATORY TECHNIQUE ON IMPROVING LUNG FUNCTION IN CHRONIC BRONCHITIS

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Dissertation submitted to

THE TAMILNADU DR. M. G. R. MEDICAL UNIVERSITY,

CHENNAI-32.

Project work evaluated on ----------

Internal Examiner External Examiner

CERTICATE I

This is to certify that the dissertation work entitled **"A COMPARATIVESTUDY ON EFFECTIVENESS OF FORCED EXPIRATORY TECHNIQUE ON IMPROVING LUNG FUNCTION IN CHRONIC BRONCHITIS"**was carried out by **Reg. no.27102325** P.P.G College of physiotherapy, Coimbatore-35, affiliated to The Tamilnadu Dr. M.G.R medical university, Chennai-32, under the guidance of **Pro. B.G. Raja M.P.T (Cardio).**

Dr. K. RAJA SENTHIL M.P.T (Cardio-Resp), MIAP, PhD

Principal

CERTIFICATE II

This is to certify that the dissertation workentitled

"**A COMPARATIVE STUDYON EFFECTIVENESS OF FORCED EXPIRATORY techniqueON IMPROVING LUNG FUNCTION IN CHRONIC BRONCHITIS"**

was carried out by Reg**.No.27102325** P.P.G College of physiotherapy, Coimbatore-35, affiliated to The Tamilnadu Dr. M.G.R. Medical University, Chennai-32,

under my Guidance and direct supervision.

Prof. B.G. Raja M.P.T (Cardio)

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ABSTRACT

Study Objective: To examine the effectiveness of forced expiratory technique along with conventional therapy in improving Lung function in chronic chronic bronchitis.

Participants: 30 subjects with chronic chronic bronchitis were selected. They were divided into control group and experimental group with 15 patients each.

Outcome measure: The outcome measurement is done by spirometer.

Result: Both groups showed significant improvement in lung function after the therapy program .The experimental group showed a statistically significant improvement in pulmonary function when compared to the control group at 5 % level of significance.

Conclusion: Treatment with the –forced expiratory technique along with conventional physiotherapy showed a significant improvement in lung function and dyspnoea than control group. It can be used as an effective treatment in improving the forced expiratory values. A well designed trial is needed to study the effectiveness of forced expiratory technique in improving lung function in a large group and to know its long term effect.

Keywords: Spirometer, forced expiratory technique,Chronic bronchitis, Dyspnoea, Lung function.

CHAPTER-I

1.1 INTRODUCTION

Chronic bronchitis is one of the most common chronic disorders in world, with estimates that more than 15 million individuals are affected including approximately 7% of all children. Mortality associated with Chronic bronchitis, although relatively low in actual members, has increased during the past 2 decades, adding to this increase clear evidence of Chronic bronchitis morbidity becoming a greater problem in the inner cities than elsewhere.

Chronic bronchitis is characterized by bronchial smooth muscle hyperactivity may be reversed, either with medication or spontaneously. The common Chronic bronchitis stimuli include pollens, inhalants, foods, medications, dyes, air pollution, injection, cigarette smoke, exercise, and cold, dry inhaled air. Once the patient encounters the stimulus, a series of pathophysiological events results in classic signs and symptoms of Chronic bronchitis.

The pathology in Chronic bronchitis includes bronchial smooth muscle contraction and hypertrophy, mucus secretion and inflammation of the airways with edema. Several theories of bronchial smooth muscle spasm have been previously identifies. In addition to muscle spasm, bronchial smooth muscle hypertrophy will occur at time. Large numbers of inflammatory cells are found in the airways of individuals with Chronic bronchitis. The inflammatory response of the airways in Chronic bronchitis includes heightened bronchial smooth muscles reactivity. In addition, both the direct and reflex stimulation of bronchial smooth muscle contraction may be elicited.

Signs and symptoms of Chronic bronchitis include wheezing, dyspnea, and coughing that in patient’s early stages of the acute episode are non-productive.

Chronic bronchitis management involves pharmacological and non-pharmacological modalities.

Environmental control of Chronic bronchitis triggers such as animal danger, dust mites, cockroach dust, and molds are thought to be helpful in reducing symptoms.

Chronic bronchitis medication are sometimes categorized as relieving medication, which are short-term basis and controlling medications, which are used on chronic basis.

In multidisciplinary team physiotherapy plays a vital role especially in Chronic bronchitis. There is a repeated acute stages affecting in respiratory apparatus.

Physiotherapy prevents, maintains and improves the pulmonary function of the Chronic bronchitis patients. In that Forced Expiratory Techniques (FET) gives a multidimensional activity of respiratory system may improves function of respiratory system.

Even now we need a further research work on FET on asthma patients in Tamilnadu.

1.2. NEED OF STUDY

Chronic bronchitis is a major health problem in most of the development countries. The airway obstruction due to Chronic bronchitis can be defined any abnormal increase resistance to air flow.

Most of the pathophysiological changes usually develop on the order over the course of the disease.

So for the most burdening condition it can be treated by wide of intervention life bronchodilators therapy, diaphragmatic breathing exercise, etc. here were concern about the treatment of the Forced Expiratory Technique (FET).

Hence there is a need was felt to do further research work on forced expiratory exercise in improving the pulmonary function of Chronic bronchitis patient.

1.3. OPERATIONAL DEFINITION

Chronicbronchitis

Chronic bronchitis is a pathologic condition characterized by a chronic hypersecretion ofmucus in the bronchial tree in association with a recurrent productive cough notattributable to a specific disease.

-James L. Bennington

Dyspnea

Shortness of breath or difficulty in breathing associated with a subjective awareness of discomfort with each respiratory effort.

-James L. Bennington

FEV1

FEV1 is the maximum amount of air you can forcefully exhale in one second. It is then converted to percentage of normal. For example, your FEV1 may be 80% of predicted based on your height, weight, and race. FEV1 is a marker for the degree of obstruction with your Chronic bronchitis:

- FEV1 greater 80% of predicted = normal.
- FEV1 60% to 79%of predicted = mild obstruction.
- FEV1 40% to 59% of predicted = moderate obstruction.
- FEV1 less than 40% of predicted = severe obstruction.

-pat bass

1.4. AIM OF THE STUDY

To study the effectiveness of **Forced expiratory techniques**for improving pulmonary function in Chronic bronchitis patients.

1.5. OBJECTIVE OF THE STUDY

* To evaluate the effectiveness of forced expiratory exercise in Chronic bronchitis patient.

* To find out the effectiveness of forced expiratory exercise on improving Dyspnea in Chronic bronchitis patients.

* To find out the effectiveness of found expiratory exercise on improving the forced expiratory volume per second (FEV1).

1.6. HYPOTHESIS

Null hypothesis

There is no significant effect of Forced Expiratory Technique (FET) on improving pulmonary function of Chronic bronchitis patients.

Alternate Hypothesis

There is significant effect of Forced Expiratory Technique (FET) on improving pulmonary function in Chronic bronchitis patient.

CHAPTER-II

REVIEW OF LITERATURE

WJ DePaso, RH Winterbauer, JA Lusk., 1991,

Most patients with chronic dyspnea will haveChronic bronchitis. 72 consecutive physician referred patients had dyspnea greater than one –month duration unexplained by the initial history physical examination, chest roentgenogram, & spirometry. Definite cause for dyspnea was recognized in 58 patients and no answer found in 14. Dyspnea due to pulmonary disease in 26 patients, cardiac disease in 10 patients, hyperventilation in 14 and only 3 patients had extra thoracic disease causing dyspnea.

L. Olseni, B. Midgren., 1993,

The aim of this study was to measure the short-term effects on mucus clearance after forced expiratory technique (FET) combined with either postural drainage (PD) or positive expiratory pressure (PEP) on two different days. Clearance during PD+FET was significantly higher than during PEP+FET in the total using field ($P<0.05$) and in the peripheral region ($P<0.004$). the patients found the two methods equally efficient but most of the patients preferred PEP as a treatment.

E.R. Mc. Fadden. Jr., M.D., 1995,

Although wheezing is believed to be a cardinal manifestation of Chronic bronchitis, some patients with this disorder may not present with wheezing, but rather with either exertional dyspnea or cough. In such patients with dyspnea, there was peripheral airway dysfunction markedly elevated residual volumes, frequency, dependence of dynamic compliance and depresses flow rates in the middle –vital capacity range, whereas specific conductance

Thompson and Thompson., 1998,

FET was first described by Thompson and Thompson, a New Zealand physician and therapist team working with patients with Chronic bronchitis. They described the use of 1 or 2 huffs from middle to low lung volumes, with the glottis open, preceded and followed by a period of relaxed, controlled diaphragmatic breathing with slow deep breaths.

Secretions mobilized from the lower to upper airways were expectorated, and the process was repeated.

American College of Chest Physician., 2006,

Recommended that patient with Chronic bronchitis should be taught huff and FET as adjuncts to other methods of sputum clearance.Similarly, for patients with Chronic bronchitis, autogenic drainage should be taught as an adjunct to postural drainage, to clear sputum.

James B. Fink., 2007,

In health, secretions produced in the respiratory tract are cleared by mucociliary transport, cephalad airflow bias, and cough. In disease, increased secretion viscosity and volume, dyskinesia of the cilia, and ineffective cough combine to reduce secretion clearance,leading to increased risk of infection. Techniques have been developed to optimize expiratory flow and promote airway clearance**.** Directed cough, forced expiratorytechnique, active cycle of breathing, and autogenic drainage are all more effective than placebo and comparable in therapeutic effects to postural drainage; they require no special equipment or care- provider assistance for routine use.

Pryor et.al., 2007,

Described the mechanism of FET in patients with Chronic bronchitis using the concept of the equal pressure point, as presented by Mead et.al., They reported that use of FET with postural drainage improved secretion clearance, compared to postural drainage alone.

Resiman and co-workers., 2007,

Compared the long-term effects of postural drainage with percussion and FET to FET alone, in 69 patients with Chronic bronchitis over a 3 year period. The CPT method included routine drainage positions and percussion, for 8 min each. FET consisted of 2 maximal inspirations, followed by a prolonged, controlled, forced expiration, and normal quiet breaths, each followed by a prolonged, controlled expirations, a minimum of 3 huff cough were performed until there was no sputum to expectorate.

Hasani et.al., 2007,

Correlated the viscoelastic properties of sputum and maximum expiratory flow with mucus clearance via instructed cough the FET in 19 patients with airways obstruction. Each patient underwent control, cough, and FET. Compared with control run clearance (16+3%) there was better clearance from the whole lung with cough (44+5%) and FET (42+5%) and better clearance of inhaled radio labeled aerosol from the trachea, inner, and intermediate regions of the lung. There were no significant difference between cough and FET.

Braiman A. Priel.Z., 2008,

The respiratory mucociliary epithelium is a synchronized and highly effective waste-disposal system. It uses mucus as a vehicle, driven by beating cilia, to transport unwanted particles, trapped in the mucus, away from the respiratory system. The ciliary machinery can function in at least two different modes, a low rate of beating that requires only ATP, and a high rate of beating regulated by second messengers. The mucus propelling velocity is linearly dependent on ciliary beat frequency**.**

Coffman et.al., 2011,

Exercise spirometry is the standard method for assessing patients with Chronic bronchitis forced expiratory volume in one second (FEV1) of 40-69% predicted according to a systematic literature review by Coffman et.al, but the prevalence of gastroesophageal reflux in Chronic bronchitis patients without reflux symptoms.

CHAPTER-III

MATERIAL AND METHODOLOGY

3.1. MATERIAL USED

- Spiro meter
- Pillow
- Sputum cup
- Evaluation chart
- Data collection sheet
- Low couch
- Chair
- Foot stool
- Dyspnea scale

3.2. METHODOLOGY

3.2.1. Study deign

A comparative Quasi Experimental study design.

3.2.2. Sampling design

The randomized sampling techniques were used in this study.

3.2.3. Sample size

The sample size consists of 30 subjects with Chronic bronchitis.

3.2.4. Criteria for selection

Inclusion Criteria

- Age group 35-60 years.
- FEV1/FEV>40 %(mild to moderate).

Exclusion Criteria

- Unstable cardiac disease.
- Neuromusculo skeletal diseases.
- Corpulmonale
- Uncontrolled hypertension and hypotension
- An acute illness

- Pulmonary embolism
- Increased intracranial pressure
- Mental or cognitive impairment

3.2.5. Study setting

The study was conducted at Ashwin hospital, Coimbatore and Kovai Respiratory Care Centre.

3.2.6. Study method

The sample size consists of 30 subjects with Chronic bronchitis were selected and assigned in to two groups:

1) Controlled group

2) Experimental group

3.2.7. Duration of the study

Data collection was done for a period of three months

3.2.8. Parameters

- Spirometer.
- Subjective rating of Intercity dyspnea scale

3.2.9. Statistical tools

All the statically analysis were done using t-test.

The formula for the t test

t-test

$$S = \sqrt{\frac{\Sigma d^2 - \frac{(\Sigma d)^2}{n}}{n-1}}$$

$$t = \frac{\bar{d}\sqrt{n}}{s}$$

d = difference between the pre and post test

$\bar{d}$ = mean difference

n = Total number of subjects

S = Standard calculation.

The unpaired t-test f was used to compare statically significant difference in the dependent valuables between the two groups.

Unpaired 't'test

$$S = \sqrt{\frac{\Sigma (x_1 - \bar{x}_1)^2 + \Sigma (x_2 - \bar{x}_2)^2}{n_1 + n_2 - 2}}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s} \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

n_1 = Total number of subject in controlled group

n_2 = Total number of subject in experimental group

$\bar{x}_1$ = Mean of control group

$\bar{x}_2$ = Mean of experimental group

S = Standard deviation

3.2.10. Techniques

The samples were collected randomly, assigned in to two groups; the study population included only those met the inclusive criteria, 30 subjects was divided in to two groups.

Group A: Controlled group were given conventional physiotherapy.

Group B: Experimental group were given conventional physiotherapy and FET.

Control group A were given conventional physiotherapy for 40 minutes and experimental group B was given conventional physiotherapy and FET for 60 minutes.

Control Group (group A)

Received conventional physiotherapy which includes

Education (5 minutes)

Educating the patient and family about the technique for smoking cessation and dangers associated with smoking; patient should be encouraged to quit smoking. Education regarding the preventive measures such as on keeping pets outdoors, on using a mark for dusty jobs, avoiding spray polishes, exposures to pollutants and on avoiding certain foods that is allergic.

Relaxation positions (10 minutes)

Educate the patients regarding the relaxed positions to be adopted during the attack of the breathlessness. The relaxation positions for a breathlessness patient are in

- High side lying.
- Forward lean sitting.
- Relaxed sitting.
- Forward lean standing.
- Relaxed standing.

Breathing Techniques (10 minutes)

Diaphragmatic Breathing Technique:

- Lie on your back on a flat surface with knees bent and head support.
- Place one hand on upper chest and other just below your ribcage.
- Tighten your stomach muscles, letting them fall inward as you exhale through pursed lips. The hand on your upper chest must remain as still as possible.

Breathe control during walking (5 minutes)

Treating correct breathing pattern with expiration to inspiration ratio 2:1, and expiration for the first two steps and inspiration for the next one step.

Chest Mobility Exercise (10 minutes)

1. To mobilize one side of the chest:
    - While sitting, have the patient bend away from the tight side to lengthen tight structure and expand that side of the chest during inspiration.
    - Progress by having the patient raise the arm to the tight side of the chest over the head and side bend away from the tight side. This will place an additional stretch on tight tissues.

2. To mobilize the upper chest and stretch pectoralis muscles.
    - While the patient is sitting in a chair with hands clasped behind the head, have patient horizontally abduct the arms during deep inspiration.

3. To mobilize upper chest and shoulders.
    - While patient sitting in a chair, have reach with both arms over head during inspiration. Then patient bend forward at the hips and reach for floor during expiration.

Group B (experimental group)

Received conventional treatment for 40 minutes along with forced expiratory techniques, which included for 20 minutes.

Forced Expiratory Technique:

Procedure: The forced expiration technique is a technique for mobilizing and expectorating bronchial secretions. It is an integral part of the active cycle of breathing techniques and is used in appropriate gravity positions, modified gravity positions or in sitting.

An outline for the regimen is:

a. Breathing control.
b. 3-4 thoracic expansion exercises with or without chest clapping.
c. Breathing control.
d. 2-3 thoracic expansion exercises with or without shaking or chest vibrations.
e. Breathing control.
f. 1-2 huffs.
g. Breathing control.

As secretions reach the upper airways a huff or cough at a high-lung volume is used to clear them. The active cycle is repeated until a huff to low-lung volume is dry sounding and non-productive. These can provide an end-point for the treatment for both physiotherapist and patient. During episodes of acute infection it may be advisable to stop before this point is reached to give the patient a rest. A minimum of 10 minutes in each productive position is recommended.

The regimen of the active cycle of breathing techniques can be with or without an assistant. Without an assistant the chest clapping may be omitted and chest shaking or chest vibrations are usually omitted. Positioning, the periods of breathing control, thoracic

expansion exercises and the forced expiration technique are continued, often with self chest compression to reinforce the huff. The patient is completely independent.

3.2.11. Treatment Procedure

Written content was being obtained from the patient. Each patient will undergo formal evaluation of the inclusion into the study. Before starting the treatment the complete procedure was explained to the patient. Subjects were advised not to undergo any other exercise or treatment during the study period

CHAPTER-IV

DATA PRESENTATION

TABLE-1

DATA REPRESENTATION FEV1 IN CONTROLLED AND EXPERIMENTAL GROUP

S.NO	CONTROLLED		EXPERIMENTAL	
	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
1.	1.99	2.30	2.10	2.80
2.	2.0	2.40	2.20	2.90
3.	2.10	2.40	2.0	2.70
4.	2.20	2.70	2.0	2.80
5.	1.99	2.50	2.0	2.70
6.	1.90	2.30	1.90	2.60
7.	2.0	2.40	1.90	2.80
8.	2.0	2.40	2.10	2.90
9.	1.80	2.10	2.30	3.10
10.	2.10	2.50	1.80	2.50
11.	2.20	2.70	1.90	2.70
12.	2.30	2.70	2.30	3.10
13.	2.10	2.50	2.0	2.90
14.	2.0	2.30	2.20	3.20
15.	1.90	2.30	1.80	2.60

TABLE-2

DATA REPRESENTATION OF DYSPNEA IN CONTROLLED AND EXPERIMENTAL GROUP

S.NO	CONTROLLED		EXPERIMENTAL	
	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
1.	+ 4	+ 3	+ 4	+ 2
2.	+ 3	+ 2	+ 2	+ 1
3.	+ 2	+ 1	+ 3	+ 1
4.	+ 4	+ 2	+ 4	+ 2
5.	+ 3	+ 2	+ 4	+ 2
6.	+ 2	+ 1	+ 4	+ 1
7.	+ 2	+ 1	+ 2	+ 1
8.	+ 3	+ 2	+ 3	+ 1
9.	+ 3	+ 2	+ 4	+ 2
10.	+ 4	+ 3	+ 4	+ 2
11.	+ 4	+ 3	+ 3	+ 1
12.	+ 3	+ 2	+ 2	+ 1
13.	+ 2	+ 2	+ 4	+ 2
14.	+ 4	+ 3	+ 4	+ 1
15.	+ 4	+ 3	+ 4	+ 2

CHAPTER-V

DATA ANALYSIS AND INTERPRETATION

TABLE-3

PRE AND POST TEST VALUE OF FEV1 IN CONTROLLED GROUP

S. No	Controlled group	Mean	Standard Deviation	't' Value
1.	Pre test	2.03	0.07	21.56
2.	Post test	2.59		

The calculated **'t'** value between pre versus post exercise session of controlled group was21.52 at 0.05% which is greater than tabulated value (1.960). The result showed that there is a significant difference in pre and post test values.

TABLE-4

PRE AND POST TEST VALUE OF FEV1 IN EXPERIMENTAL GROUP

S. No	Experimental group	Mean	Standard Deviation	't' Value
1.	Pre test	2.43	0.09	33.54
2.	Post test	2.82		

The calculated **'t'** value between pre versus post exercise session of experimental group was 33.54 at 0.05% which is greater than tabulated value (1.960). The result showed that there is a significant difference in pre and post test values, and also controlled group value.

TABLE-5

POST TEST VALUE OF FEV1 IN CONTROLLED AND EXPERIMENTAL GROUP

S. No	High Intensity group	Mean	Standard Deviation	't' Value
1.	Controlled group	2.59	0.19	5.61
2.	Experimental group	2.82		

The calculated **'unpaired t'** value between post versus post exercise session of controlled and experimental group was 5.61 at 0.05% which is greater than tabulated value (1.960). The result showed that there is a significant difference.

TABLE-6

PRE AND POST TEST VALUE OF DYSPNEA IN CONTROLLED GROUP

S. No	Controlled group	Mean	Standard Deviation	't' Value
1.	Pre test	3.13	0.38	10.18
2.	Post test	2.13		

The calculated **'t'** value between pre versus post exercise session of controlled group was 10.18 at 0.05% which is greater than tabulated value (1.960). The result showed that there is a significant difference in pre and post test values.

TABLE-7

PRE AND POST TEST VALUE OF DYSPNEA IN EXPERIMENTAL GROUP

S. No	Experimental group	Mean	Standard Deviation	't' Value
1.	Pre test	3.4	0.59	12.66
2.	Post test	1.4		

The calculated **'t'** value between pre versus post exercise session of experimental group was 12.66 at 0.05% which is greater than tabulated value (1.960). The result showed that there is a significant difference in pre and post test values, and also controlled group value.

TABLE-8

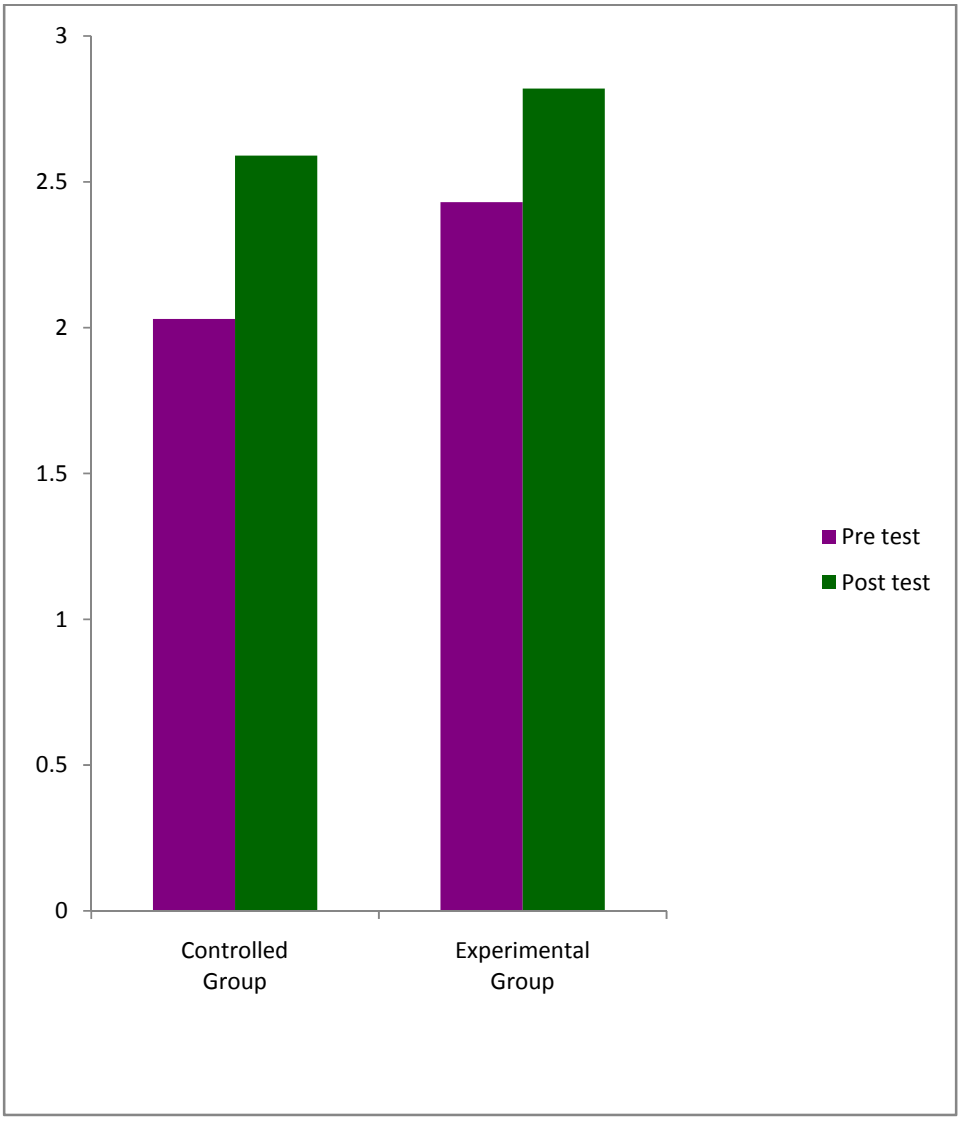
POST TEST VALUE OF DYSPNEA IN CONTROLLED AND EXPERIMENTAL GROUP

S. No	High Intensity group	Mean	Standard Deviation	't' Value
1.	Controlled group	2.13	0.64	4.23
2.	Experimental group	1.4		

The calculated **'unpaired t'** value between post versus post exercise session of controlled and experimental group was 4.23 at 0.05% which is greater than tabulated value (1.960). The result showed that there is a significant difference.

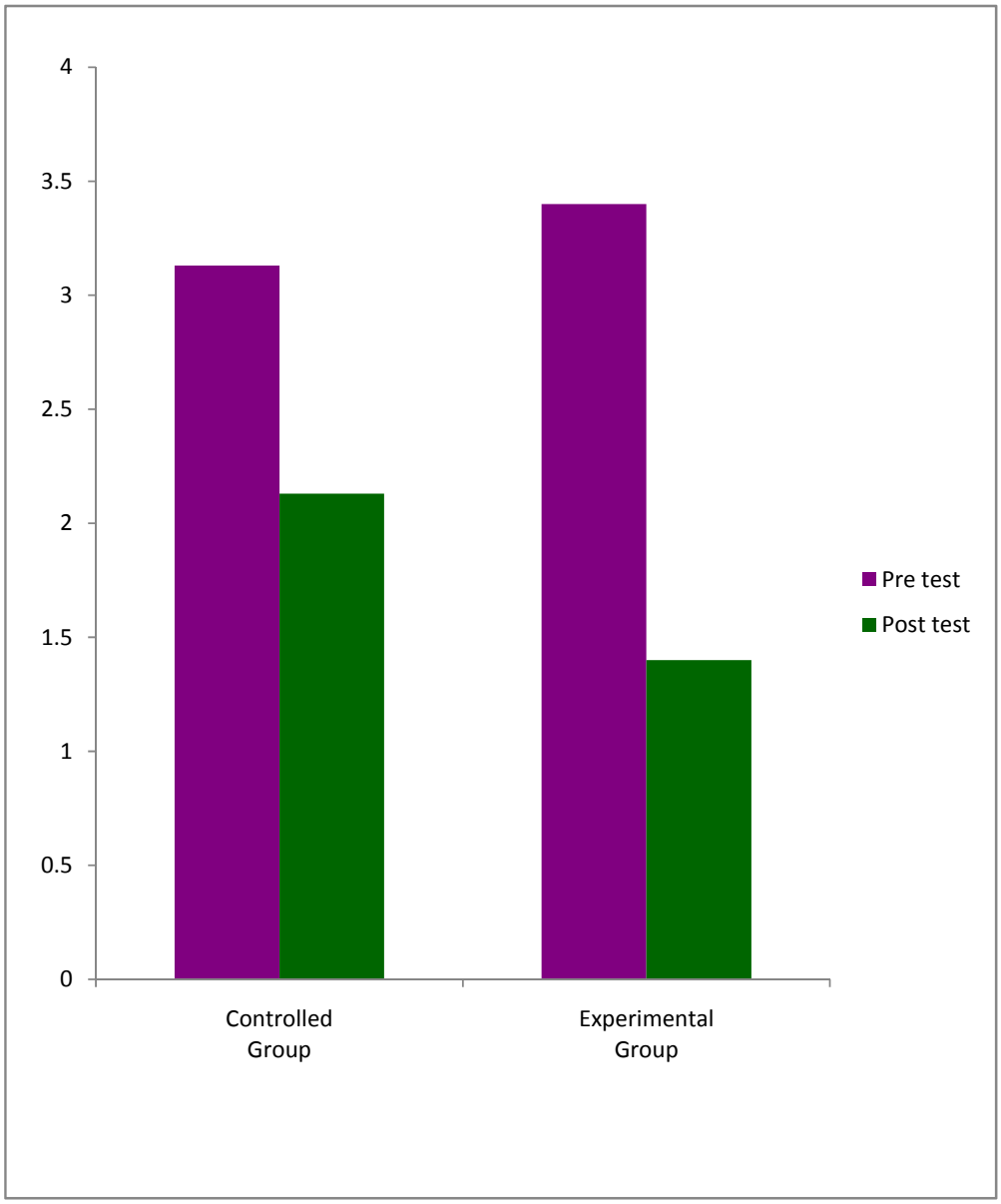
GRAPH - 1

GRAPHICAL REPRESENTATION OF FEV_1



GRAPH - 2

GRAPHICAL REPRESENTATION OF DYSPNEA



CHAPTER-VI

DISCUSSION

Chronic bronchitis is a pathologic condition characterized by a chronic hypersecretion of mucus in the bronchial tree in association with a recurrent productive cough not attributable to a specific disease.

Our aim of study is effectiveness of forced expiratory techniques used to improving the pulmonary function on Chronic bronchitis patients.

In the thesis, 30 subjects were selected randomly and they assigned into two groups, controlled and experimental with 15 each. Forced expiratory volume in one second measured by spirometer and dyspnea scale was recorded in two groups.

Control group were treated with conventional physiotherapy, breathing exercise(diaphragmatic breathing), chest mobility, and breathe control during walking.

Experimental group treated with conventional physiotherapy added with forced expiratory technique.

Resiman et.al (1998) concluded that there was a greater deterioration in lung function alone over a three-year period, when the forced expiration technique alone was used.

The forced expiration is made using the chest wall and abdominal muscles. Breathing control is an essential part of the forced expiratory technique to allow relaxation of the bronchial, muscles after the forced expiratory maneuver of the huff. The FET is a technique for mobilizing and expectorating bronchial secretions. It helps to airway clearance and increase the forced expiratory volume per second in Chronic bronchitis patient.

In dyspnea there is improvement in Chronic bronchitis patient after giving the FET when to compared to the compared group. The severity of the dyspnea is measured by the subjective rating of intercity dyspnea scale in both groups and the value is applied to the “t” test. There is marked improvement is found in both controlled and experimental group, but greater significance is found in experimental group**.**

CHAPTER - VII

RESULT

The purpose of the study was to examine the effectiveness of the FET (Forced Expiratory Technique) improves lung function in patients with Chronic bronchitis. The study used is an experimental study. The population included the patients diagnosed as asthma. Those patients were randomly assigned into control group and experimental group of 15 each. Control group received conventional physiotherapy including breathing exercises, relaxation techniques, and chest mobility exercises. The experimental group received FET in addition to conventional physiotherapy. Pre-test evaluation was done on the first day prior to treatment and post test evaluation was done on the last day of treatment. The tools selected for measuring the outcome of the study were subjective rating of intensity rating scale, Wright Spirometer increased FEV1 ((Forced Expiratory valume per second). The values are statistically analyzed by‘t’ test.

In FEV1, the mean post test score for experimental group 2.82 and mean pretest score for experimental group is 2.43 and ”t” value obtained is 33.54 which statistically significant at 0.05% level. The mean of pretest score for controlled group is 2.03 and post test score is 2.54 and the ‘t ‘value obtained is 21.56 which is statistically significant ta 0.05% level. Post score are greater than the pre values at 0.05% level of significance and also greater in experimental group. Data analysis shows significant improvement in FEV1 in experimental groups. This might be due to the cumulative effect of Forced Expiratory Techniques.

In dyspnea the mean post test score for experimental group 2.13 and mean post test score for experimental group is 1.4. “t” value obtained is 4.23 which statistically significant at 0.05% level. The mean of pretest score for controlled group is 3.13 and post test score is 2.59 ant ‘value obtained is 10.18 which is statistically significant ta 0.05% level. Post score are greater than the pre values at 0.05% level of significance and also greater in experimental group. Data analysis shows significant improvement in dyspnea rates in experimental groups. This might be due to the cumulative effect of FET.

In this study prove the FET and conventional physiotherapy techniques are more effective than conventional physiotherapy techniques. So alternative hypothesis is accepted.

CHAPTER – VIII

SUMMARY AND CONCLUSION

SUMMARY:

In this study prove the FET and Conventional Physiotherapy techniques are more effective then Conventional Physiotherapy techniques in Chronic Bronchitis. There is marked improvement is found in both conventional and experimental group, but greater significance is found in experimental group in Chronic bronchitis.

CONCLUSION :

It can be concluded FET may be useful in pulmonary rehabilitation of patients with Chronic bronchitis.Hence FET may be included as one of the protocol in pulmonary rehabilitation programs in patients with Chronic bronchitis.

CHAPTER - IX

LIMITATIONS AND SUGGESTIONS

Limitations

1. Size of the sample was very small.

2. The study was of short duration.

3. Frequency of attacks was not recorded.

4. The researcher was not able to assess the other psychological parameters of the patients.

Suggestions

1. A large sample size is required to explain more about effectiveness

2. To make the result more valid, a long term study may be carried out.

3. Regular home and follow up program can be included to know the long term effect of treatment.

CHAPTER – X

BIBLIOGRAPHY

1. Aspi F Golwalla, ***Text book of medicine***,18th edition, 1999, National Book Company. Carolyn kisner, ***Therapeutic exercise***, 3rd edition, 1996, Jaypee.
2. M.Dena Gardiner, ***Principles of exercise therapy***, 4th edition, 2000, CBS
3. Christopher haslett, ***Davidson's principles and practice of medicine,*** 19th edition, 2005, Churchill Livingstone
4. Clarke SW, "Cough and muco ciliary clearance",1994.
5. M.Dena Gardiner, ***Principles of exercise therapy***, 4th edition, 2000, CBS.
6. Elizabeth dean, ***Principles and practice of cardio pulmonary physical therapy***, 3rd edition, 1997, Mosby Giglohi Fs, "Breathing retraining in patients with obstructive disease".
7. Goodman, ***Pathology, implications for the physical therapist***, 2nd edition, 2003, W.B.Saunders. Jennifer A pryor, ***Physiotherapy for respiratory and cardiac problems,*** 3rd edition, 2004, Churchill Livingstone.
8. Joanne Watchie, ***Cardio pulmonary physical therapy***, a clinical manual, 1st edition, 2003, W.B.Saunders.
9. Juzar Ali, ***Pulmonary patho physiology***, 1st edition, 1999, Mc.Graw Hill.
10. Harrison, ***Principles of internal medicine***, 4th edition, 1962, Mc. Graw Hill. Lawerence M Tierney***, Current medical diagnosis and treatment,*** 41st edition, 2002, Mc.Graw Hill.
11. Mandy smith, ***Cash's text book of cardiovascular and respiratory physiotherapy***, 1st edition, 2005, Mosby.
12. Margaret hollis, ***Practical exercise therapy***, 4th edition, 2001, Blackwell.
13. P.J. Mehta, ***Practical medicine***, 15th edition, 2001, National Book Company. Elliott MW, Adams L, Cockcroft A, Macrae KD, Murrhy K, Guz A. The language of breathlessness. Am Rev Respir Dis 1991;144:826

14. Nield M, Kim MJ, Patel M. Use of magnitude estimation for estimating the parameters of dyspnea. Nurs Res 1989;38:77-80.
15. Borg G. Psychophysical bases of perceived exertion. Med Sci Sports Exerc 1982;14:377-81.

CHAPTER – XI

REFERENCES

1. Bateman.E.D,HurdS.S,Barnes P.J et al.*Global Strategy for* Chronic bronchitis*management and prevention* ,GINA executive summary .EurRespir J 2008,31:143-78.

2. Busse WW, Calhoun WF, Sedwick JD. Mechanism of airway inflammation in Chronic bronchitis.Am Rev Respir Dis. Jun 1993; 147

3. Bestall JC, Paul EA, Garod R, Jones PW, WedzichaJ*A. Usefulness of the MRC dyspnoea scale as a measure of disability in patientswith* Chronic bronchitis, .1999; 54:581-586

4. National Heart, Lung, and Blood Institute. Global strategy for Chronic bronchitis management and prevention. NLH publication 2008

5. Murray JF, Nadel JA, structure of the lungs relative to their principal function. In: textbook of respiratory Medicine. WB Saunders Co;1988

6. Ana Lucia Bernardo DecervalhoMorsch, Maria Marta Amoraim .*Influence of oscillatory positive expiratory pressure and the forced expiratory technique on sputum cell counts and quantity of induced sputum in patients with* Chronic bronchitis*or COPD*.(2008)Vol34 Ed 12-Page 1026-1033

7. Jones HA, Marino PS, Shakur BH, Morell NW. in vivo assessment of lung inflammatory cell activity in patients with COPD and Chronic bronchitis. EurRespir J.Apr2003

8. Alves CE, Nunes LQ, and Melo PL: *Mechanical Analysis of anOscillatory Positive Expiratory Pressure Device used in* respiratory *Rehab*, conf Proc IEEE eng Med Biol Soc. 2010; 2477-80.

9. Campbell A H, O'Connell J M, Wilson F. 1975. The effect of chest physiotherapy upon FEV1 in Asthma Medical journal of Australia 1: 33-35Partridge C, Pryor J, Webber B, 1989Characteristics of the Forced expiration technique Physiotherapy 75:193-194.

10. Thompson B.Thompson HT 1968 Forced expiration exercises in asthma and their effect on FEV1 New Zealand Journal of Physiotherapy 3: 19-21.

CHAPTER – XII

APPENDIX I

ASSESSMENT FORM

- Name:
- Age:
- Sex:
- Occupation:
- Chief complaints:
- Address:
- Hospital No.:
- Referred doctor:
- Diagnosis:
- Reason for reference:

HISTORY

- History of present condition:

Onset-

Duration -

Aggravating Factors-(Cause for increase in intensity)-

Alleviating Factors-(Rest, remedial medications-use of inhalers or PUFFS,)-

- Past medical history:
- Personal history:
- Smoking history:
- Family history:
- Psychosocial History:
- Socioeconomic history:

SUBJECTIVE EVALUATION OF CARDINAL SYMPTOMS:

A.DYSPNOEA

On strenuous activity:

On ordinary activity:

At Rest:

B.WHEEZE

Diurnal Variations:

Postural Variations:

Aggravating Factors:

C.COUGH

Productive:

Dry:

Timing (at night, cold air, exercise,):

D.SPUTUM

Color:

Consistency:

Quantity:

E.EXTRIMITIES

Edema:

Cyanosis:

Clubbing:

OJECTIVE ASSESSMENT:

ON OBSERVATION

VITAL SIGNS

ON INSPECTION

ON AUSCULTATION

ON PERCUSSION

ON PALPATION

INVESTIGATIONS

PROBLEM LIST:

TREATMENT PLAN:

Physical Therapist Student Signature

APPENDIX – II

PATIENT CONSENT FORM

TITLE: EFFECTIVENESS OF FORCED EXPIRATORY TECHNIQUE ON IMPROVING PULMONARY FUNCTION IN CHRONIC BRONCHITIS

INVESTIGATOR: _ _ _ _ _ _ _ _ _ _ _

PURPOSE OF THE STUDY:

I_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ ,have been informed that this study will work towards achieving on the functional activities of daily living in post-stroke conditions for me and other patients.

PROCEDURE:

Each term of the study protocol has been explained to me in detail. I understand that during the procedure, I will be receiving the treatment for one time a day. I understand that I will have to take this treatment for four weeks.

I understand that this will be done under investigator, _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ supervision. I am aware also that I have to follow therapist's instructions as has been told to me.

CONFIDENTIALITY:

I understand that medical information provided by this study will be confidential. If the data are used for publication in the medical literature or for teaching purposes, no names will be used and other literature such as audio or video tapes will be used only with permission.

RISK AND DISCOMFORT:

I understand that there are no potential risks associated with this procedure, and understand that investigator will accompany me during this procedure. There are no known hazards associated with this procedure.

REFUSAL OR WITHDRAWL OF PARICIPATION:

I understand that the decision my participation is wholly voluntary and I may refuse participate, may withdraw consent at any time during the study.

I also understand that the investigator may terminate my participation in the study at any time after researcher has explained me the reasons to do so.

I _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ have explained to ……. the purpose of the research, the procedures required and the possible risks and benefits, to the best of my ability.

…… ……

Investigator Date

I ……. Confirm that researcher has explained me the purpose of the research, the study procedure and the possible risks and benefits that I may experience. I have read and I have understood this consent to participate as a subject in this research project.

…….. ……

Subject Date

…….. …….

Signature of the Witness Date

Physical Therapist Student Signature

APPENDIX-III

SCALE FOR DYSNEA (Subjective rating of Intercity Dyspnea scale):

+1	Mild Difficulty, noticeable to the patient but not the observer
+2	Mild Difficulty, noticeable to the observer
+3	Moderate Difficulty, patient camp continue
+4	Severe difficulty patient cannot continue